

Investigation

3

Inverse Variation

In Investigation 1, you discovered that the relationship between bridge thickness and bridge strength is approximately linear. You also found that the relationship between bridge length and bridge strength is not linear. In this investigation, you will explore other nonlinear relationships.

3.1 Rectangles With Fixed Area

In recent years, the populations of many small towns have declined as residents move to large cities for jobs. The town of Roseville has developed a plan to attract new residents. The town is offering free lots of land to “homesteaders” who are willing to build houses. Each lot is rectangular and has an area of 21,800 square feet. The lengths and widths of the lots vary.



Getting Ready for Problem 3.1

- What are some possible dimensions for a rectangular lot with an area of 21,800 square feet?

In Problem 3.1, you will look at patterns in length and width values for rectangles with fixed area.

Problem 3.1 Relating Length and Width

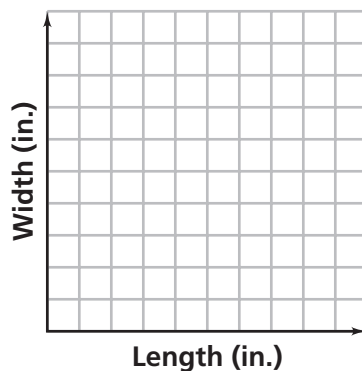
A. 1. Copy and complete this table.

Rectangles With Area 24 in.²

Length (in.)	1	2	3	4	5	6	7	8
Width (in.)	■	■	■	■	■	■	■	■

2. Plot your data on a grid like the one below. Then, draw a line or curve that seems to model the pattern in the data.

Rectangles With Area 24 in.²



3. Describe the pattern of change in the width as the length increases. Is the relationship between length and width linear?
 4. Write an equation that shows how the width w depends on the length ℓ for rectangles with an area of 24 square inches.
- B. Now consider rectangles with an area of 32 square inches.
1. Write an equation for the relationship between the length ℓ and the width w .
 2. Graph your equation. Show lengths from 1 to 15 inches.
- C. Compare your equations. How are they similar? How are they different?
- D. Compare your graphs. How are they similar? How are they different?

ACE Homework starts on page 53.